

(1) THE PERMANGANATE ABSORPTION-SPECTRUM: A CLAIM FOR PRIORITY. (2) A FORMULA FOR CALCULATING THE URANIUM SPECTRUM.

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(1) In Part VII, Section III, p. 47 of "Colour and Chemical Constitution," published in these Transactions two years ago, I gave the formula— $n = \frac{1}{\lambda} = 1750 + 78 N$ (in which N represents the 7 natural numbers from 0 to 6) by means of which the positions of the 7 absorption-bands of the permanganates in dilute water solution could be calculated.

I now find that an Italian investigator, E. Adinolfi, has practically rediscovered this formula. He states his result as $n = n_3 \pm 75.3 N$, but his n_3 refers to the third (viz. the strongest) band, whereas my figure 1750 refers to the first band. Subtracting therefore 2×75.3 from his value of n_3 (viz. 1902.8) we get 1752.2. Adinolfi's formula thus reads: $\frac{1}{\lambda} = 1752.2 + 75.3 N$ and

is practically the same as mine, since the decimal points mean nothing in observations of this sort, which are not capable of a higher accuracy than 0.1 per cent. The following table exhibits the results of the calculations:

	Adinolfi's formula.	Moir's formula.	Moir's observations.
Line I .	1752	1750	1750
Line II .	1827 $\frac{1}{2}$	1828	1830
Line III .	1903	1906	1906
Line IV .	1978	1984	1990
Line V .	2053	2062	2060
Line VI .	2129	2140	2133
Line VII	2204	2218	2204

Adinolfi's observations are in the Journal of the Academy dei Lincei, 1920, and are therefore inaccessible to me, but they apparently do not differ from mine by more than 0.1 per cent. It is probable that the 7 bands are really 10, 3 of which overlap and thus cause the great intensity of II and III, and also the small irregularity of the spacing.

(2) The spectrum of the Uranyl Ion has already been given (*l. c.*, p. 48).

The following formula explains it in mathematical terms, viz. $n = \frac{1}{\lambda} = 2113 + 66 N$ (in which N is 0, 1, 2, 3, and 4) :

Calculated : 2113, 2179, 2245, 2311 and 2377.

Observed : 2114, 2180, 2243, 2310 and 2381.

As shown in the same paper the bands of the unionised solid salts can be calculated fairly closely from these figures by dividing by the sixth-root of the ratio of the molecular weight of the salt to that of UO_2^{++} . Thus the bands of autunite are given by—

$$n = \frac{1}{\lambda} = \frac{2113 + 66N}{\sqrt[6]{\frac{914}{2 \times 270}}} = 1937 + 60\frac{1}{2}N$$

Calculated : 1937, 1997, 2058, 2118 and 2179.

Observed : 1945, 2000, 2062, 2128 and 2190.

I wish to thank Mr. T. P. Waites for the fine specimen of autunite in crystals large enough to permit observing the absorption-spectrum.